



Department of Energy

Washington DC 20585

February 28, 2001

Dr. Hermann A. Grunder, []
Argonne National Laboratory
9700 South Cass Avenue
Building 201
Argonne, IL 60439-4832

EA-2001-01

Subject: Preliminary Notice of Violation

Dear Dr. Grunder:

This letter refers to the Department of Energy's (DOE) evaluation of a number of events and programmatic management failures that occurred at the Argonne National Laboratory-West (ANL-W or the Laboratory). These included (1) a worker contamination event at the Fuel Conditioning Facility (FCF), (2) [Radiological] Hazard Control Statement violations at FCF, (3) a source mishandling event at the Transient Reactor facility, (4) the failure to conduct required effective management assessments at the FCF, and (5) the ANL-W failure to implement an effective quality resolution process. The Laboratory attributed these events to a number of causes, including lack of adequate management attention, inadequate procedures, and failure to follow procedures.

DOE is concerned since these problems reflect a lack of timely management attention to correct deficiencies identified either through your own investigations or directly by DOE. For example, your investigation of the March 1998 [radioactive material] fire at the Fuel Manufacturing Facility (FMF) identified deficiencies with procedural adequacy, training, and the performance of comprehensive safety reviews. Similar deficiencies were noted in relation to the current events. The DOE Enforcement Letter of February 1999, noted deficiencies in work control, implementation of conduct of operations requirements, and quality improvement in relation to events at the FCF. Subsequent DOE Price-Anderson Program Reviews conducted in 1999 and 2000 continued to identify issues associated with Quality Improvement despite the multiple prior notices.

The problems identified above were reviewed by the DOE Office of Price-Anderson Enforcement (OE) during a September 2000, site visit. An Investigation Summary Report describing the results of that review was issued on January 8, 2001. An Enforcement Conference was held on January 31, 2001, in Germantown, Maryland, to provide ANL-W the opportunity to discuss these issues. A Conference Summary

Report is enclosed. Based on our evaluation of these problems and events, DOE has concluded that violations of the Quality Assurance Rule (10 CFR 830.120) and Occupational Radiation Protection Rule (10 CFR 835) have occurred. The violations are described in the enclosed Preliminary Notice of Violation (PNOV).

The enclosed PNOV describes violations that involve multiple failures to (1) implement an effective quality improvement process; (2) conduct work activities in accordance with ANL-W established work procedures; (3) conduct required management assessments; and (4) implement effective measures to maintain exposures As Low As Reasonably Achievable.

The violations described in Section I of the enclosed PNOV relate to the failure of ANL-W to fully meet the Quality Improvement requirements of 10 CFR 830.120. Cited deficiencies include the failure of ANL-W to implement an effective formal quality problem resolution process until March 2000, fully five years after the effective date of 10 CFR Part 830.120. Additionally, DOE found in September 2000, that the Database for Improvement Opportunity Tracking (DIOT) sitewide problem identification and resolution process was not being consistently implemented in that findings from assessments were not routinely being placed in DIOT, and consequently the process lacked effectiveness. DOE had noted inadequacies in the ANL-W quality improvement process in an Enforcement Letter of February 1999, and a PAAA Program Review report of November 1999.

Deficiencies were also cited related to ANL-W's failure to conduct root cause determinations and to implement comprehensive corrective actions for identified quality problems. In two separate instances, ANL-W failed to conduct cause determinations for significant programmatic PAAA noncompliances until prompted to do so by DOE. Further, ANL-W corrective actions undertaken in response to a material transfer deficiency at FCF were initially limited in scope until DOE prompting again led to a wider application of corrective actions by the Laboratory. The lack of an effective process to correct identified problems can lead to a serious event when precursors of major problems are not addressed. Due to this potential significance and the substantial prior notice of the problem, in accordance with the criteria described in the Enforcement Policy (10 CFR 820, Appendix A), these quality improvement process problems have been classified collectively as a Severity Level II problem.

The violations described in Section II of the enclosed PNOV involve instances where work was not conducted in accordance with established procedures. Specific problems include the March 2000, movement of radioactive sources at the Transient Reactor facility without required Health Physics coverage and the February 2000, violation of material transfer procedures at the FCF. Your investigation into the latter event identified that similar violations of material transfer procedures had been occurring over the past several years, and it involved multiple workers and Responsible Individuals (RI). The inappropriate use of the General Information Use (GIU) procedural categorization, which created a general impression that nuclear safety related procedures were voluntary, contributed to the overall problem.

DOE recognizes ANL-W formally reported a programmatic noncompliance related to procedural noncompliance in September 1999, and has since undertaken corrective actions to address this noncompliance. However, in light of the long-standing and widespread nature of the FCF material transfer deficiencies and the initially limited corrective actions taken in response to the procedural categorization issue, DOE has determined it appropriate to collectively categorize the violations associated with these events as a single Severity Level II problem.

The violation described in Section III of the PNOV involves the failure to conduct management assessments of the implementation of the material transfer and control process procedures at the FCF. Although the risk due to failure to conduct management assessments may be low in this particular case, such a weakness could lead to a more serious problem if allowed to become more widespread. DOE has concluded that this violation represents a Severity Level III problem.

Section IV of the PNOV relates to an April 2000, event in which a worker was contaminated during the patching of penetration holes in the Hot Repair Area of the FCF. The cited violation relates to the failure to effectively analyze the planned activity and associated hazards, and subsequently utilize effective design and administrative controls to maintain worker exposures ALARA. Although the worker intake resulting from the event was low, the activity involved the potential for significant levels of contamination. DOE also viewed your initial corrective actions as limited in that they focused on the failure of the worker to stop work and failed to address underlying deficiencies in hazard analysis and radiological work planning. DOE has concluded this violation represents a Severity Level III problem.

I am issuing the enclosed PNOV in response to these violations. Although ANL-W is exempt from civil penalties by statute, DOE would have issued a proposed Imposition of Civil Penalty in the amount of \$110,000 (\$55,000 for each Severity Level II violation) in this case. No mitigation for self-identification or corrective actions is warranted, due to (1) the self-disclosing nature of the events, (2) prior notice of the problems by DOE or by your own investigation process, and (3) the limited scope or lack of timeliness associated with many of the corrective actions.

Notwithstanding the above violations, it is noted that several significant steps have recently been taken by the Laboratory and the University of Chicago to address the problems reflected by this enforcement action. Management changes have been made to place greater emphasis and visibility on the nuclear safety requirements of Price-Anderson. The University has established a Committee reporting to the Board of Governors to monitor performance in the safety and health area, increased management attention is being paid to nuclear safety issues and the status of corrective actions and performance metrics, a senior management individual was given responsibility to ensure completion of corrective actions, training has been provided in root cause analysis methods, and various work control administrative enhancements have been completed. These improvements are encouraging, but continued

management attention to the weaknesses reflected in this enforcement action will be critical in order to achieve a substantial improvement in the safety culture for operations at ANL-W.

You are required to respond to this letter and to follow the instructions specified in the enclosed PNOV when preparing your response. Your response should document any additional specific actions taken to date to address the safety problems discussed above. Corrective actions will be tracked in the Noncompliance Tracking System (NTS). You should enter into the NTS (1) any additional actions you plan to prevent recurrence and (2) the anticipated completion dates of such actions. With respect to your commitment at the Enforcement Conference to conduct an assessment of effectiveness of corrective actions for the problems addressed in this enforcement action, you are required to provide a copy of the results of such reviews as well as plans to address any continuing weaknesses that are identified to the Manager of the DOE Chicago Operations Office within thirty (30) days of the completion of the effectiveness reviews.

Sincerely,



R. Keith Christopher
Director
Office of Price-Anderson Enforcement

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Enclosures:
Preliminary Notice of Violation
Enforcement Conference Summary Report
List of Attendees

cc: S. Cary, EH-1
M. Zacchero, EH-1
H. Wilchins, OE
T. Weadock, OE
D. Stadler, EH-2
F. Russo, EH-3
C. Rick Jones, EH-5
W. Magwood, NE-1
E. Tourigny, NE-30
L. Miller, NE-40
M. Gunn, CH
J. Drago, CH PAAA Coordinator
R. Wunderlich, Argonne Area Office Manager

A. Creig Zook, Argonne Area Office PAAA Coordinator
M. Holzmer, Argonne Area Office West- Site Team Coordinator
J. Geringer, Argonne Area Office West- PAAA Coordinator
R. Zimmer, University of Chicago
J. Sackett, [], ANL-W
Docket Clerk, OE

Preliminary Notice of Violation

University of Chicago
Argonne National Laboratory-West

EA-2001-01

As a result of the Department of Energy's (DOE) evaluation of continuing quality problems at the ANL-W facilities, violations of DOE nuclear safety requirements were identified. In accordance with the "General Statement of Enforcement Policy", 10 CFR 820, Appendix A, DOE is issuing this Preliminary Notice of Violation. The particular violations are set forth below.

I. Quality Improvement

10 CFR 830.120(c)(1)(iii), Quality Improvement, requires that processes to detect and prevent quality problems shall be established and implemented. Items, services, and processes that do not meet established requirements shall be identified, controlled, and corrected according to the importance of the problem and the work affected. Correction shall include identifying the causes of problems and working to prevent recurrence.

Contrary to this requirement, ANL-W failed to effectively implement processes for the detection, prevention and correction of quality problems in that—

- A. As of September 1999, no ANL-W formal process was in place for quality problem tracking, control and resolution. In response to DOE concerns over the lack of such a process, ANL-W then instituted a process in March 2000 called the Database for Improvement Opportunity Tracking (DIOT) to formally track and control identified quality problems. Additionally, in September 2000, DOE found that this approved process was not being consistently implemented with the timely inclusion of identified quality problems. For example, findings from a DOE assessment of Conduct of Operations, completed in May 2000, had not been incorporated into the DIOT system by September 2000, to manage resolution of the findings. Similarly, ANL-W management acknowledged that a backlog of other assessment findings had not been incorporated into the system to manage resolution.
- B. In the following two cases, significant programmatic problems were identified by ANL-W and reported into the Noncompliance Tracking System (NTS) and

evaluations to identify the causes of the significant quality problems were not performed, namely:

1. In November 1999, DOE noted that ANL-W had failed to conduct an analysis to identify the causes of repeated incidents of failure to follow nuclear safety procedures at the site. An ANL-W analysis was subsequently conducted only after DOE expressed concern at the lack of such an analysis.
 2. In September 2000, DOE found that ANL-W had failed to conduct an analysis to identify the causes of an identified programmatic training deficiency.
- C. Corrective actions developed in response to an identified ANL-W procedure categorization deficiency were inadequate in scope. An ANL-W investigation into material transfer deficiencies at the Fuel Conditioning Facility (FCF) identified that the procedural category of General Information Use (GIU) had been improperly applied to procedures requiring strict compliance in order to assure adequate nuclear safety.

ANL-W corrective actions related to this concern were not applied sitewide but were limited to reviewing FCF procedures. As a result of this review, seven FCF procedures were re-categorized. However, DOE was required to specifically bring this to the contractor's attention and request attention to the matter on a sitewide basis before efforts were made to evaluate categorization at other site facilities. In response to repeated DOE concerns in this area, ANL-W expanded their review to other site facilities, ultimately determining that 115 of 387 site procedures were inappropriately categorized for their respective activities.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - \$55,000 (exempted)

II. Work Processes

10 CFR 830.120(c)(2)(i) Work Processes, requires that work shall be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate methods.

Contrary to this requirement, ANL-W failed to perform work to established technical standards and administrative controls using approved instructions, procedures and other appropriate methods, in that—

- A. On February 20, 2000, during a zone to zone transfer of a [] Transfer Container (MTC) in the FCF, violations of requirements established by the “[Nuclear] Hazards Control Statement for the Fuel Conditioning Facility” (CHCS) occurred. These violations included the following:

1. Failure to have a Responsible Individual (RI) for the destination zone approve the transfer prior to performing the transfer.
2. Failure to complete the zone-to-zone transfer form prior to initiating the transfer.
3. Failure to notify FCF facility management promptly when the discrepancy in location of the MTC was first discovered.
4. Failure to develop adequate procedures to implement the CHCS requirements.

A subsequent ANL-W investigation into the event identified that similar MTC procedural violations involving multiple facility personnel had been occurring at the FCF over the past several years.

- B. On March 23, 2000, a Transient Reactor Test Facility (TREAT) technician and researcher failed to comply with procedural requirements during calibrations of the Multiple Detector Assay System (MDAS). Specifically:
1. The controlling RWP for the activity ("Use of sources for MDAS detector calibration") required the presence of a Health Physics Technician (HPT) when removing, handling and securing neutron sources. Contrary to this requirement, personnel performed two separate movements of a neutron calibration source without an HPT in attendance.
 2. ANL-W Radiation Safety Manual Section IV, Chapter 1, *Radiation Surveys*, section 4.1.4, requires that the results of radiation surveys must be recorded on survey maps, in Health Physics Logbooks, or on shipping forms or special survey maps. Contrary to this requirement, the results of RWP-required radiation surveys performed by the HPT to support detector calibrations were not formally recorded using any of the above mechanisms.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - \$55,000 (exempted)

III. Management Assessments

10 CFR 830.120(c)(3)(I), Management Assessment, requires that "...Managers shall assess their management processes. Problems that hinder the organization from achieving its objectives shall be identified and corrected."

Contrary to the above, prior to February 21, 2000, material transfer operations at the FCF were not effectively assessed by ANL-W management. An incident and subsequent contractor investigation into material transfer operations at that facility identified that multiple and long-standing noncompliances of the controlling procedure (FCF-01-1302) and the facility [Nuclear] Hazards Control Statement were occurring. These noncompliances involved multiple facility operators and applicable RI. The

contractor incident investigation report, issued March 2000, stated that no indication could be found that FCF management had done any evaluations, audits, or assessments of the material transfer activity or compliance with FCF-01-1302. During an enforcement conference on January 31, 2001, FCF management acknowledged that FCF management assessment activities had not evaluated this area.

This violation constitutes a Severity Level III problem.

IV. Radiological Controls

10 CFR 835.1001(a) requires that "...Measures shall be taken to maintain radiation exposure in controlled areas as low as is reasonably achievable (ALARA) through facility and equipment design and administrative control. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls and procedural requirements shall be employed only as supplemental methods to control radiation exposure."

Contrary to the above, effective design features and administrative controls were not used to maintain radiation exposures to workers ALARA during a patching activity in the Hot Repair Area on April 11, 2000. The activity involved placing two metal patches (using sealant and screws) over penetration holes in a contamination barrier. The inside of the barrier was highly contaminated and the penetration holes had been previously covered with tape. Contractor evaluation of the activity did not adequately recognize the vulnerability of the tape barrier nor the potential for contamination spread associated with the activity. No supplemental barrier or controls (such as special inspection and survey requirements, detailed pre-work briefings, labeling or posting of the tape barrier, additional protective clothing or respiratory protection) were implemented for the activity. The work was inappropriately conducted with a general RWP, which did not allow opening of known contaminated systems. Prior to or during the work activity, the tape over the second hole became partially dislodged resulting in the skin contamination of the worker and spread of contamination to the surrounding work area.

This violation constitutes a Severity Level III problem.

Pursuant to the provisions of 10 CFR 820.24, Argonne National Laboratory-W is hereby required within 30 days of the date of this Preliminary Notice of Violation (PNOV) to submit a written statement or explanation to the Director, Office of Price-Anderson Enforcement, Attention: Office of the Docketing Clerk, EH-10, P.O. Box 2225, Germantown, MD 20874-2225. Copies should also be sent to the Manager, DOE Chicago Operations Office, and to the Cognizant DOE Secretarial Office for the facilities that are the subject of this Notice. This reply should be clearly marked as a "Reply to a Preliminary Notice of Violation" and should include the following for each violation: (1) admission or denial of the alleged violations; (2) any facts set forth which are not correct; and (3) the reasons for the violations if admitted, or if denied, the basis for the denial. Corrective actions that have been or will be taken to avoid further violations will

be delineated with target and completion dates in DOE's Noncompliance Tracking System. In the event the violations set forth in this PNOV are admitted, this Notice will constitute a Final Notice of Violation in compliance with the requirements of 10 CFR 820.25.

A handwritten signature in black ink that reads "R. Keith Christopher". The script is cursive and fluid, with the first name "R." being small and the last name "Christopher" being larger and more prominent.

R. Keith Christopher
Director
Office of Price-Anderson Enforcement

Dated at Germantown, MD
this 28th day of February 2001

Enforcement Conference Summary
CH-AA-ANLW-FCF-2000-0002 and CH-AA-ANLW-TREAT-2000-0001

The DOE Office of Price-Anderson Enforcement (OE) held an Enforcement Conference with Argonne National Laboratory-W (ANL-W) and University of Chicago personnel on January 31, 2001, in Germantown, Maryland. OE convened the meeting to discuss the facts, circumstances, root causes, and corrective actions pertaining to a series of safety issues at ANL- West described in a DOE Investigation Summary Report dated January 8, 2001.

The conference was called to order by R. Keith Christopher, Director, Office of Price-Anderson Enforcement. A list of attendees is attached. The specific issues discussed were:

1. A series of issues pertaining to quality improvement requirements set forth in 10 CFR 830.120(c)(1)(iii);
2. A personnel contamination during hot repair area (HRA) refurbishment;
3. Quality deficiencies at the Fuel Conditioning Facility (FCF);
4. Source handling without required health physics coverage; and
5. Sitewide work process deficiencies.

Initially, Robert Zimmer, representing the University of Chicago, and Yoon Chang, representing the Laboratory, stated their concern with the events and activities that led to the underlying investigation, and pledged their resources to rectifying safety problems at the ANL-W site.

John I. Sackett, [] ANL-W, and the individual in charge of day-to-day activity at the site made the main presentation. Dr. Sackett stated that the Laboratory has no basic disagreement with the issues cited in the DOE Investigation Summary Report. He emphasized the Laboratory's commitment to safety and devoted the remainder of his presentation to a discussion of the corrective actions taken and planned to rectify safety issues. This, in turn, was intended to show that the Laboratory understands DOE's concerns and is prepared to move aggressively to address them.

A copy of the presentation material has been placed in the DOE docket file. Each issue was addressed by Dr. Sackett and was discussed by the assembled group. In particular, ANL-W described programmatic weaknesses at the site which resulted in the ineffective identification of safety problems and the failure to timely address underlying causes. With respect to each issue, ANL-W identified work underway to identify

causes, provide for appropriate documentation, develop and implement corrective actions and assess the effectiveness.

At the conclusion of this discussion, Mr. Christopher adjourned the conference.

January 31, 2001

Argonne National Laboratory- West
Material Transfer without Appropriate Administrative Controls/
Radiological Contamination and Source Handling Events

List of Attendees

DOE Office of Price-Anderson Enforcement

R. Keith Christopher, Director
Howard M. Wilchins, Senior Litigator
Tony Weadock, Enforcement Specialist
Steve Zobel, Enforcement Specialist
Steven Hosford, Technical Advisor
Hank George, Technical Advisor

DOE Office of Nuclear Energy

Robert Lange, Associate Director of Facilities
Ed Tourigny, Program Director, Reactors Deactivation
John Warren, ANL-W Facility Project Manager
Susan Leis, Engineer

DOE Office of Oversight

Frank Russo, PAAA Coordinator

DOE Chicago Operations Office

Joe Drago, PAAA Coordinator

DOE Argonne Area Office

Bob Wunderlich, Area Office Manager
A. Creig Zook, PAAA Coordinator

DOE Argonne Area Office- West

Mark Holzmer, Team Leader
Jim Geringer, PAAA Coordinator

University of Chicago

Robert J. Zimmer, [] Argonne National Laboratory

Argonne National Laboratory

Yoon Chang, []

Adam Cohen, []

John Sackett, [], Argonne National Laboratory-West

Gary L. Lentz, [], Argonne National Laboratory-West

Gary C. Marshall, ANL-W PAAA Coordinator